

WHAT IS CLAIMED IS:

1. An image forming apparatus, comprising:

a plurality of optical systems and a plurality of image carriers,
each optical system scanning a surface of a corresponding image

5 carrier with a laser beam in a main scanning direction to form an image
of a specific color on the image carrier;

a plurality of first detecting units and a plurality of second
detecting units, each first detecting unit being situated at a first position
along the main scanning direction of a corresponding laser beam and
10 each second detecting unit situated at a second position along the main
scanning direction of the corresponding laser beam, wherein the first
detecting unit and the second detecting unit detect the corresponding
laser beam; and

a clock frequency adjusting unit that, counts number of clocks of
15 a write clock during a period since a desired one of the first detecting
units detects the corresponding laser beam until a desired one of the
second detecting unit detects the corresponding laser beam, selects a
count of the number of clocks for one laser beam as a reference value,
and adjusts a write clock frequency of each of the laser beams other
20 than the one lased beam so as to coincide with the reference value.

2. The image forming apparatus according to claim 1, wherein the
first detecting unit is situated at a scanning start position and the
second detecting unit is provided at a scanning finish position.

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3. The image forming apparatus according to claim 1, further comprising a plurality of third detecting units, each third detecting unit being situated at a third position along the main scanning direction of a corresponding laser beam, wherein the third detecting unit detects the
5 corresponding laser beam, wherein

the clock frequency adjusting unit, counts number of clocks of a write clock during a period since any of the first detecting units, the second detecting units, and the third detecting units detects the corresponding laser beam until any of an adjoining first detecting unit,
10 second detecting unit, and third detecting unit detects the corresponding laser beam, takes a count of the number of clocks for one laser beam as a reference value, and adjusts a write clock frequency of each of the laser beams other than the one lased beam so as to coincide with the reference value.

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4. The image forming apparatus according to claim 1, wherein the clock frequency adjusting unit includes a phase-locked loop with variable filters and that multiplies a reference clock by a multiple N, and the clock frequency adjusting unit varies the number of filters in the
20 phase-locked loop and the multiple N to adjust the write clock frequency.

5. The image forming apparatus according to claim 1, wherein when selecting the reference value, the clock frequency adjusting unit
25 selects a count of number of clocks for a laser beam as the reference

value so that an amount of adjustment of the write clock frequency of the laser beams becomes minimum mutually.

6. The image forming apparatus according to claim 1, wherein the
5 second detecting unit is a linear charge-coupled device.

7. The image forming apparatus according to claim 1, wherein the
clock frequency adjusting unit performs the adjustment of the write
clock frequency when the image forming apparatus is booted.
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8. The image forming apparatus according to claim 1, further
comprising a temperature detector that detects an ambient temperature,
and a determining unit that detects whether a change in predetermined
time of the ambient temperature detected by the temperature detector is
15 higher than a predetermined value, wherein

the clock frequency adjusting unit performs the adjustment of
the write clock frequency upon the determining unit detecting that the
change of the ambient temperature being higher than the
predetermined value.
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9. The image forming apparatus according to claim 1, wherein the
period since a desired one of the first detecting units detects the
corresponding laser beam until a desired one of the second detecting
unit detects the corresponding laser beam is calculated an average of
25 periods since each of the first detecting units detects the corresponding

laser beam until each of the second detecting unit detects the corresponding laser beam.

10. The image forming apparatus according to claim 1, wherein a
5 condition of image forming process is set after the clock frequency
adjusting unit performs the adjustment of the write clock frequency.

11. The image forming apparatus according to claim 1, further
comprising:

10 an intermediate transfer body of which surface moves endlessly;
and

a plurality of image forming units disposed opposite to the
moving surface of the intermediate transfer body, wherein

the image forming unit includes

15 an image carrier that carries an electrostatic latent
image;

a writing unit that writes the electrostatic latent image on
the image carrier;

a plurality of developing units each of which develops the
20 electrostatic latent image on the image carrier; and

a switching unit that selects and drives one of the
developing units.

12. A method of correcting timing for generating laser beams in an image forming apparatus, the image forming apparatus having a plurality of optical systems and a plurality of image carriers, each optical system scanning a surface of a corresponding image carrier with a laser beam in a main scanning direction to form an image of a specific color on the image carrier, the method comprising:

detecting the laser beams at least at a first position and a second position, wherein the first position and the second position being on the main scanning direction of each laser beam;

10 counting number of clocks of a write clock during a period since the laser beam is detected at a desired one of the first position until the laser beam is detected at a desired one of the second position;

selecting a count of the number of clocks for one laser beam, out of the counts of the number of clocks for the laser beams, as a reference value; and

15 adjusting a write clock frequency of each of the laser beams other than the one lased beam so as to coincide with the reference value.